surface of the rotor core 3.

FIG. 4 shows a cross section of a rotor of a synchronous motor on a plane perpendicular to an axis of a rotor shaft 2 according to a fourth embodiment. In this embodiment, magnets 1 are arranged radially in the rotor core 3. An outer periphery F of each pole L of the rotor is defined by a curve of a hyperbolic function.

IN THE DRAWINGS:

Please Amend the Drawings in accordance with the enclosed Letter to the Examiner Requesting Approval of Changes to the Drawings.

IN THE CLAIMS:

Please AMEND claims 1-7 as follows:

1. (ONCE AMENDED) A circular rotor for a synchronous motor, comprising:

a plurality of poles, where at least a part of an outer periphery of one pole of the rotor, in a cross section perpendicular to a central axis of the rotor, is defined by a curve of a hyperbolic function.

2. (ONCE AMENDED) A circular rotor for a synchronous motor according to claim 1, wherein more than half of the outer periphery of the one pole of the rotor is defined by the hyperbolic function.

3. (ONCE AMENDED) A circular rotor for a synchronous motor according to claim 1, wherein all of the outer periphery of the one pole of the rotor is defined by the hyperbolic function.

4. (ONCE AMENDED) A circular rotor for a synchronous motor according to claim 1, wherein a central part of the outer periphery of the one pole is defined the hyperbolic function.

5. (ONCE AMENDED) A circular rotor for a synchronous motor according to claim 1, wherein the hyperbolic function is expressed as $R = A\text{-}B * (e^{c\theta} + e^{-c\theta})$, where R represents a distance from a central axis of the rotor or a fixed point, θ represents a rotational angle from a